Section III−12 Traffic Control Signals
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Traffic control signals are valuable devices for the control of motor vehicle and pedestrian traffic. Because they assign the right-of-way to the various traffic movements, traffic signals exert a profound influence on traffic flow.

Traffic control signals, properly located and operated, usually have one or more of the following advantages:

1. They can provide for the orderly movement of traffic.
2. Where proper physical layouts and control measures are used, they can increase the traffic−handling capacity of the intersection.
3. They can reduce the frequency of certain types of crashes, especially the right− angle type.
4. Under favorable conditions, they can be coordinated to provide for continuous or nearly continuous movement of traffic, at a definite speed, along a given route.
5. They can be used to interrupt heavy traffic at intervals to permit other traffic, vehicular or pedestrian, to cross.

   Even though warranted, if not properly placed, operated, or maintained, the following can result:

   - Excessive delay may be caused.
   - Disobedience of the signal indication is encouraged
   - The use of less adequate routes may be induced in an attempt to avoid the signal.
   - Crash frequency (especially the rear−end type) can be significantly increased.

III−12.01 Engineering Study

Because there are disadvantages as well as advantages in the use of traffic signals, it is important to conduct an engineering study of the traffic operations before placing a signal at a particular location. Generally, this is conducted by the Planning Division and the recommendations are contained in the Traffic Operations Report.

III−12.02 Warrants

A careful analysis of traffic operations and other factors at a large number of signalized and unsignalized intersections, coupled with the judgment of experienced engineers, have provided a series of warrants that define the minimum conditions under which signal installations may be justified.

There are eleven (11) warrants and they may be found in Part IV C of the Manual on Uniform Traffic Control Devices, (MUTCD).

III−12.03 Resources and References

- The Traffic Signal Book
- Manual of Traffic Signal Design
- Traffic Control System Handbook
- The Highway Capacity Manual for timing and lane assignments.
- Manual on Uniform Traffic Control Devices

III−12.04 Standards and Standard Drawings

Application of Indications	Section 4B−6− MUTCD
Visibility and Shielding of Signal Faces	Section 4B−11&12−MUTCD
Feed Points	D−772−1
Traffic Signal Standards	D−772−2
Traffic Signal Standards (mast arm type)	D−772−3
Traffic Signal Head Mounting	D−772−4
Loop Detectors Details	D−772-5
Loop Details	D−772−5A
Interim Signals	D−772−6
Flashing Beacons	D−772−7

These standards can be found on www.state.nd.us under design division standards.